DEPARTMENT OF ENVIRONMENT, FOOD AND RURAL AFFAIRS
CEFAS, LOWESTOFT LABORATORY, SUFFOLK, ENGLAND

2002 RESEARCH VESSEL PROGRAMME

REPORT: RV CORYSTES: CRUISE 02/02

STAFF:	JD Metcalfe (SIC)	RP Flatt
	K Turner	C Stewart
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	MO Eagle	S Neville

DURATION: 8 April - 14 April

LOCALITY: North Sea

AIMS:

1. To catch and tag cod with coded acoustic pingers and to deploy new CEFAS data transmitting sonar buoy to monitor their subsequent residence within the vicinity of the Indefatigable Bank.

2. To use acoustic & fishing survey methods to estimate the abundance and distribution of sandeels on sandeel fishing grounds on the western Dogger Bank.

3. To use fishing survey methods to estimate the abundance and distribution of predatory fish feeding on sandeels on the sandeel fishing grounds on the western Dogger Bank..

4. To use QTC to describing sediment type in relation to sandeel distribution and abundance.

5. To carry out a shipboard experiment to determine gut evacuation rates of sandeels.

NARRATIVE: (All times are British Summer Time)

After a delay of 4 days due to the need to carry out repairs to the port trawl winch, CORYSTES finally sailed at 1830 h on 8 April and proceeded overnight to the north western end of the Indefatigable Bank to an area known as the "Hurdy Gurdy" (53° 36.929'N 02° 11.175'E), arriving on station at 0725 h the following day. Fishing for cod by rod and line commenced at about 0830 h and continued until about 2030 h, by which time 4 small (25-30 cm) cod had been caught. During this time the data transmitting sonar buoy was prepared. The buoy was subsequently deployed at 2012 h at 53° 36.94'N 02° 11.21'E and brief trials with a coded acoustic pinger, deployed on a buff from the ship, indicated that the sonar buoy was working satisfactorily.

Fishing for cod continued the following day, but again only small (<34 cm) fish were caught and none were large enough to be tagged, either with coded acoustic pingers or with data storage tags. Although full range trials with the CEFAS sonar buoy were not carried out because marginal weather precluded the safe use of the sea rider, tests using 4 CEFAS coded acoustic pingers deployed off the side of the ship indicated that tag signals were being successfully detected by the sonar buoy at ranges of at least 260 m. Subsequently, a control pinger (code 58) was deployed on static gear (chain anchor, ~ 1.5 m for rope and a trawl float), at 1927 h at 53° 37.95'N 02° 11.22'E, about 100 m from the sonar buoy. CORYSTES then steamed overnight to the survey area on the sandeel fishing grounds on the North West Riff

The systematic survey of the sandeel fishing grounds commenced at 0500 h on 11 April. However, the cruise had to be abandoned at 1500 h on 13 April due to the failure of one of the ship's main engines. CORYSTES subsequently set sail for Lowestoft at 1615 h and docked at 0950 h on 14 April.

RESULTS:

1. *Cod tagging with coded acoustic tags.* Nine cod (23 –34 cm) caught on 9 & 10 April by rod and line. However, all were too small to be tagged with 76 kHz coded acoustic pingers. These fish were retained and returned to Lowestoft.

   The CEFAS data transmitting sonar buoy was successfully deployed on the north western end of the Indefatigable Bank (the "Hurdy Gurdy") at 2012 h on 11 April at 53° 36.94'N 02° 11.21'E. Trials with coded acoustic pingers, deployed both on a buff, and from the ship, indicated that the sonar buoy was working satisfactorily and was able to detect tag signals at a range of at least 260 m. A control pinger (code 58) was deployed on static gear about 100 m from the sonar buoy. Subsequently, information from the Laboratory in the days after deployment indicated that the sonar buoy continued to detect tag signals and successfully transmit the data back to the Laboratory.

2. *Estimation of the abundance and distribution of sandeels, and sandeel preadtors, on sandeel fishing grounds on the western Dogger Bank.* The aim had been to repeat the surveys carried out on in April and June in 2000 and 2001. The survey grid is located on the North West Riff, at the south western end of the Dogger Bank, and consists of 9 legs, each 27 nm (49.22 km) long, running north-south from 54° 51'N to 54° 24'N. East-west, the legs ran 6.75' (12.49 km) apart from 01° 00'E to 01° 54'E. Six plankton/dredge stations are located 5.4' (10 km) apart along each leg. Normally, the survey strategy allows acoustic, trawl and dredge surveys to be performed successively along each leg in a single 24 h period, with the complete grid being surveyed over nine days, weather permitting. However, on this occasion, the survey was completed for only one leg of the grid due to problems with the trawl winch servo controls (11 April) and failure of the ship's main engine (13 April).

The ***acoustic survey*** was carried out from 0600 h to about 1300 h on 11, 12 and 13 April using the Simrad EK 500 dual frequency (38 & 120 kHz), split beam echo sounder with echo integration. Good echo signals were obtained and many sandeel schools were located. By combining the EK500 echo sounder output with the Quester Tangent Sea-view (QTC) seabed classification system, acoustic surveys of the sea bed sediment were carried out at the same time. During the acoustic survey, plankton samples and CTD casts were made at regular intervals along the survey grid. Plankton hauls were taken with a 0.5 m ring net (200 mpi).

Following each acoustic survey, the ***trawl survey*** was carried out along each leg between about 1300 h and 2000 h using a standard Granton trawl with a 6 mm mesh liner. Twenty minute trawls were carried out at each of the six plankton/dredge stations. Catches were sorted by species and either counted directly (small catches), or numbers were calculated by raising the total weight of the catch by the number in a weighed sub-sample. Stomach contents were examined in 20 (fewer in smaller catches) individuals of each major sandeel predator species (cod, whiting, haddock, gurnard). However, on 11 April, the trawl survey was delayed due to problems with the trawl servo controls and only two stations could be surveyed. Similarly, on 13 April, only one trawl station was surveyed prior to the failure ship's engine. Only on 12 April were all six trawl stations successfully surveyed, and numerous haddock, whiting and gurnard were caught and sampled. Preliminary analysis indicates that whiting and gurnard frequently had sandeels in their stomachs. However, haddock stomachs rarely contained sandeels. Only two cod were caught in 9 trawls!

Subsequently, the ***dredge survey*** for sandeels in the sea bed was carried out using a 1.2 m sandeel dredge from 2130 h to about 0300 h each night on 11 and 12 April. Six 10-minute tows were carried out at each dredge station/trawl station. Sandeel catches ranged from 0 to 89 fish per tow. All fish were counted and measured. Because catches were small, only one otolith sample was taken for age/length determinations.

3. *Description of sediment type in relation to sandeel distribution and abundance using QTC.* The Quester Tangent Sea-view (QTC) system in unsupervised mode was used in conjunction with the EK500 echo sounder (see 4 above) to survey the sea bed sediment in the study area from 0600 h to about 1400 h each day between 11, 12 and 13 April.

4. Shipboard experiments to determine gut evacuation rates of sandeels could not be carried out due to the early curtailment of the cruise.

JD Metcalfe
14 April 2002

SEEN IN DRAFT: A Reading, (Master)
M Reynolds, (Senior Fishing Mate)

INITIALLED:

DISTRIBUTION:

24/4/02.

Basic list +	DA Righton	C Stewart
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